2016 Spring Electrofishing (SEII) Summary Report

Big Lake (WBIC 345100)

Shawano County

Introduction and Survey Objectives

In 2016, the Department of Natural Resources conducted a one night boomshocking survey of Big Lake in order to provide insight and direction for the future fisheries management of this water body. Primary sampling objectives of this survey are to characterize species composition, relative abundance, and size structure. The following report is a brief summary of that survey, the general status of the fish populations and future management options for Big Lake.

Acres: 63
Shoreline Miles: 1.7
Maximum Depth (feet): 38
Lake Type: Spring
Public Access: No public access
Regulations: Statewide Default Regulations

WISCONSIN DNR CONTACT INFO.

Elliot Hoffman - Fisheries Technician

Wisconsin Dept. of Natural Resources
647 Lakeland Rd.
Shawano, WI 54166

Elliot Hoffman Phone: 715-526-4231
E-mail: elliot.hoffman@wisconsin.gov

Survey Information							
Site location	Survey Date	Water Temp. (F)	Target Species	Total Miles Shocked	No. of Stations	Gear	Dippers
Big Lake	6/02/2016	71	All	1.87	4	Boomshocker	2

Survey Method

- Big Lake was sampled according to spring electrofishing (SEII) protocols as outlined in the statewide lake assessment plan. The primary objective for this sampling period is to count and measure adult bass and panfish. Other gamefish may be sampled but are considered by -catch as part of this survey.
- The entire shoreline (including island) was sampled with a boomshocker. All fish captured were identified to species and measured for length. A subsample of fish were weighed and age structures collected for age and growth analysis.
- Fish metrics used to describe fish populations include proportional stock density, catch per effort, length frequency distribution, and mean age at length.

Fish Metric Descriptions
PSD, CPUE, LFD and Growth

Proportional Stock Density (PSD) is an index used to describe size structure of fish. It is calculated by dividing he number of quality size fish by the number of stock size fish for a given species. PSD values in the 30 to 50 percent range generally describe a balanced fish population.

Catch per unit effort (CPUE) is an index used to measure fish population relative abundance which simply refers to the number of fish captured per unit of distance or time. For lake surveys we typically quantify CPUE by the number and size of fish per mile of shoreline. CPUE indexes are compared to statewide data by percentiles. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state.

Length frequency distribution (LFD) is a graphical representation of the percentage of fish captured by one inch size intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

Mean Age at Length is an index used to assess fish growth. Growth structures (otoliths, spines, or scales) are collected from a specified length bin of interest (e.g. 7.0-7.5 inches for bluegill). Mean age is compared to statewide data by percentile with growth characterized by the following benchmarks: slow (<33rd percentile); moderate (33rd to 66th percentile); and fast (>66th percentile).

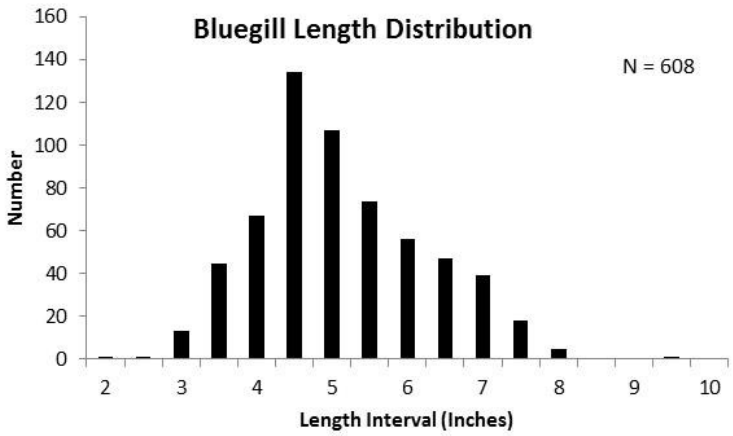
Size Structure Metrics									
Species	Total	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock No	Quality No	PSD	Percentile Rank	Size Rating
BLUEGILL	608	5.3	2.1 - 9.7	3.0 and 6.0	606	166	27%	42nd	Moderate
BLACK CRAPPIE	15	8.3	6.5 - 9.3	5.0 and 8.0	15	10	67%	67th	Moderate
LARGEMOUTH BASS	35	14.4	6.8 - 19.0	8.0 and 12.0	34	25	74%	73rd	Moderate - High
YELLOW PERCH	38	5.5	3.4 - 8.0	5.0 and 8.0	22	0	0%	-	Low

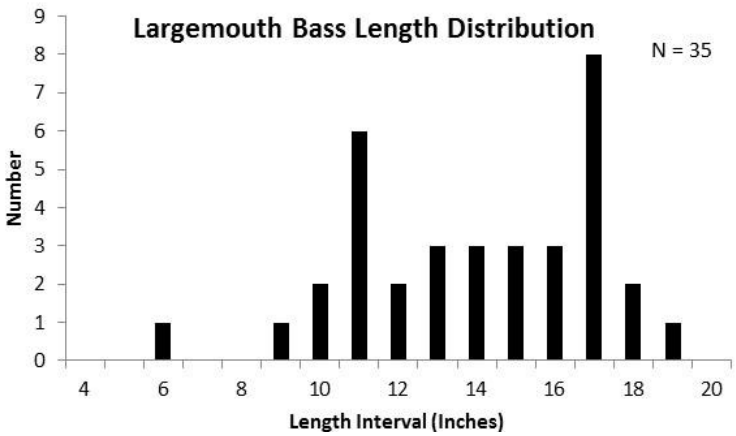
Abundance Metrics							
Species	CPUE Total (no per mile)	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Percentile Rank	Abundance Rating
BLUEGILL	608.0	98th	Very High	≥ 7.0	63	95th	High
BLACK CRAPPIE	8.0	57th	Moderate	≥ 8.0	5.3	70th	Moderate
YELLOW PERCH	38.0	82nd	Moderate - High	≥ 8.0	0	-	Low
LARGEMOUTH BASS	18.7	58th	Moderate	≥14.0	10.7	88th	High

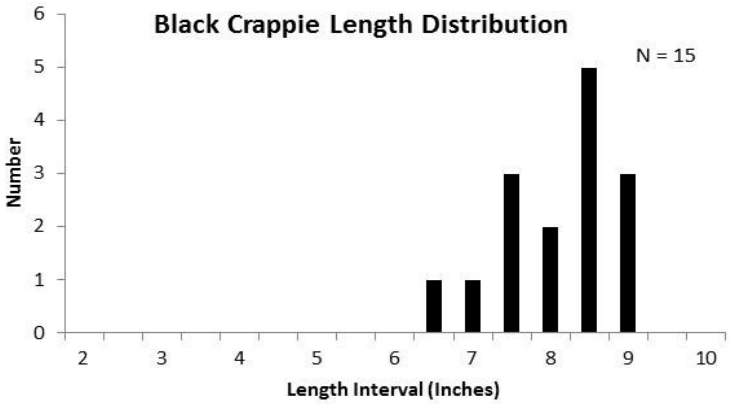
2016 Spring Electrofishing (SEII) Summary Report

Big Lake (WBIC 345100)

Shawano County







Growth Metrics						
Species	Total (N)	Length Bin (inches)	Mean Age (years)	Age Range (years)	Percentile Rank	Growth Rating
BLUEGILL	10	6.0	4.8	4 - 6	53rd	Moderate
BLUEGILL	10	7.0	5.6	4 - 8	46th	Moderate

Summary

- A total of 722 fish in 10 species were collected during our surveys. The most frequently encountered and common species were bluegill (608), largemouth bass (35), yellow perch (38), and black crappie(15).
- All fish captured were native species. Heavy concentrations of Eurasian water milfoil (an invasive aquatic plant) were encountered.
- Other fish species sampled in low abundance included common shiner (2), northern pike (2), white sucker (8), rock bass (6) and yellow bullhead (5).
- Largemouth bass was the dominant gamefish captured in our survey. Size structure and abundance metrics were found at moderate to high levels. The largest bass sampled was 19.0 inches and 57% of bass caught were greater than 14.0 inches.
- Two northern pike were captured. However, fyke netting would be a more appropriate sampling technique to assess this population.
- Yellow perch were captured in moderate to high numbers, but size structure was low with no fish over 8.0 inches captured.
- Panfish populations were comprised mainly of bluegill, black crappie, and yellow perch. Bluegill were found in high density and showed below average size structure with only 27% of our catch greater than 6.0 inches and 10% greater than 7.0 inches. Black crappie were found in average abundance and showed average size with 10% of our catch greater than 8.0 inches. Bluegill growth was average when compared to statewide data.
- PSDs (> 6.0 inches) for bluegill have decreased 34% since the last electrofishing survey done in 2010. Also to note is the CPUE for bluegills has increased 154% since the that same survey in 2010. Eurasian water milfoil is most likely playing a key role in these numbers. With abundant cover from the milfoil, it is difficult for predator fish such as northern pike and largemouth bass to prey on smaller fish. Bluegill numbers have risen and growth has slowed down for bluegills in Big Lake.

Management Options

This survey was primarily intended to assess largemouth bass and sunfish populations. Other species are captured but different survey techniques are typically used to better assess their population metrics. Therefore, management recommendations are focused on bass and panfish.

Largemouth Bass

- Management Objective: Maintain largemouth CPUE of bass > 14.0 inches at 10 - 20 per mile. Increase recruitment of young largemouth bass.
- Management Action: It is hoped that natural recruitment will increase in the future to maintain or increase largemouth bass density.

Panfish

- Panfish size structure was found at moderate levels. We recommend increasing predator density and aquatic plant management to reduce plant density and increase forage efficiency for predator fish.
- Management Objective: Increase bluegill size structure and decrease bluegill relative abundance.
- Management Action: Increase predator density to reduce panfish density and improve growth.
- In the spring or early summer of 2017 the lake association has a chemical treatment planned for Eurasian water milfoil.

Other Management Objectives:

- Currently, Big Lake is not on the sampling rotation because there is no public access. The DNR works with the lake association and Stockbridge Munsee Conservation department. In addition to the standard SEII electrofishing survey we recommend adding a spring netting survey to assess adult northern pike populations.